



**State of Tennessee
Department of Agriculture
Water Resources Program**

**FY2004 Annual Report
of the
319 Nonpoint Source Grant Program**



December 1, 2004

*Promoting the
wise use of
Tennessee's
water
resources*



Introduction

The Tennessee Department of Agriculture (TDA) manages the 319 Nonpoint Source Program with approval and oversight of the US Environmental Protection Agency. This report is required under the provisions of the grant award to TDA.

Highlights for Fiscal Year 2004

- The FY1996 expired on September 30, 2004. The closeout report is pending.
- The FY 1999 319 grant was extended until September 30, 2005.
- The FY 2000 319 grant was extended until September 30, 2006.
- The FY 2004 Grant was awarded on August 3, 2004.

The Nonpoint Source Program sponsored the Tennessee Nonpoint Source Grant Workshop on March 25, 2004. This meeting was held to highlight new requirements in the Grant Guidance; especially the watershed-based plan requirements.

FY 2004 has seen a continuation of progress from the previous year, as projects are focused on assessment and restoration of watersheds, and on increasing citizen knowledge and involvement in the improvement of our water resources. Local governments affected by the new stormwater regulations are benefiting from the educational tools offered through the grant, and local elected officials and planning agencies continue to be reached with the messages of Tennessee Growth Readiness.

It appears that the creation of new citizen-led watershed groups is continuing at a rapid pace. Parent organizations like the Cumberland River Compact are developing local interests and abilities.

Our WaterWorks! Project with MTSU has been very well received, and the relationship between this project and the Tennessee Association of Broadcasters and the Phase II stormwater communities has resulted in the audio and video broadcasts of the announcements being much higher than original estimates.

The Tennessee Department of Environment and Conservation Awards Program has honored the following 319 partners with awards recognizing the successes of their projects:

Agriculture / Forestry Stewardship Award

John P. Davis, Jr., Blount County. The John Davis farm, located in the Foothills of the Great Smoky Mountains, lies in the Ellejoy Creek watershed, which is a major source of drinking water to the citizens of Blount County. Improving and protecting water quality is at the forefront of John Davis's conservation practices. To prevent sediment and other pollutants from entering Ellejoy Creek, Mr. Davis has installed stream crossings, a heavy-use area feeding pad, alternative watering systems, and is restricting livestock access to Ellejoy Creek. He is developing a wildlife habitat plan and implementing a Management Intensive Grazing Program. Mr. Davis has been instrumental in getting other landowners to join him in adopting and implementing practices to protect water quality in the watershed.

Citizens Aquatic Resource Preservation Award

The Harpeth River Watershed Association, Middle Tennessee, is dedicated to protecting and restoring the ecological health of the entire Harpeth River. This multi-county partnership includes hundreds of supporters that include local government officials, concerned citizens, farmers, business leaders, community leaders and others. The River Restoration Program addresses the problem of stream bank erosion, demonstrates different approaches to improve water quality, and helps implement a range of best management practices in partnership with cities and local landowners.

Citizens Aquatic Resource Preservation Award

Little River Watershed Association in Blount County promotes educational activities that benefit the river and the watershed, distributes current information to the community and assists citizens in taking positive action. During 2003, the Association's first full year of operation, the LRWA planting 2,000 native trees to stabilize stream banks, removed 5 tons of litter from streams, visited 17 schools and took nearly 1,000 children to the creek to learn about water quality, provided water quality classes to 300 adults, and visited 10 locations with a traveling multimedia kiosk.

Scientific Aquatic Resource Preservation Award

The Nature Conservancy and Partners Hatchie River Project, West Tennessee. This partnership between The Nature Conservancy, state and federal agencies, county governments and local landowners addresses erosion and sediment in the Hatchie watershed. The Hatchie River is one of just a few rivers in Tennessee that has not been channelized and the natural flow of the river remains unchanged. Under the leadership of The Nature Conservancy and with the cooperation of local landowners, the partnership is restoring deep, eroding river channel in Richland Creek to its natural state. The partnership is also designing erosion control measures and exploring other conservation measures within the Dry Creek watershed.

TDA-NPS Program Vision Statement

TDA-NPS Program will be the most effective provider of 319 funding in the nation as we seek to restore and protect Tennessee's water resources from nonpoint sources of pollution.

TDA-NPS Program Mission Statement

*The mission of the TDA-NPS Program is to:
Measurably reduce nonpoint source pollution in Tennessee,
Measurably improve Tennessee's water quality,
Continuously strengthen and expand partnerships, and
Increase the water resources stewardship of Tennessee's citizens.*

TDA-NPS Program Long Term Goals

Long Term Goal 1.

Hold regularly scheduled meetings with stakeholders, to create new partnerships, strengthen existing partnerships and to foster greater trust, commitment and accountability.

Long Term Goal 2.

Fully implement all developed TMDLs for nonpoint sources in compliance with existing regulations, policies, or agreements by 2015.

Long Term Goal 3.

Restore all waters impaired by nonpoint sources that are listed on the 1998 303(d) List to the condition of fully supporting their designated uses by 2015, in cooperation with local, state and federal partners.

Long Term Goal 4.

Beginning in 2006, through regulatory and non-regulatory means, prevent previously unlisted waters from being included on the 303(d) List because of nonpoint source impairments.

Long Term Goal 5.

Improve the knowledge of stakeholders and citizens concerning the origins, magnitude, and prevention of nonpoint source pollution.

Long Term Goal 6.

Through the process of continuous improvement, routinely assess all programmatic functions of the TDA-NPS Program in order to maximize efficiency, decrease the bureaucratic burden and increase the numbers of participants in the program.

Long Term Goal 7.

Use the maximum allowable percentage of funding annually to assist partners with water quality monitoring and assessment, for the duration of the 319 program.

Project List, with Management Plan Goal Matrix

List of Projects	Long Term Goal (LTG) 1: Stakeholder Meetings	LTG 2: TMDL Implementation	LTG 3: Watershed Restoration	LTG 4: Protection of Threatened Watersheds	LTG 5: Education	LTG 6: Process Evaluation and Improvement	LTG 7: Watershed Monitoring and Assessment
Austin Peay State University: Project WET					<input checked="" type="checkbox"/>		
Bledsoe County SCD: Sequatchie River IPSI	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Blount County SCD: Ellejoy Creek UWA			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Chickasaw-Shiloh RCD: Hatchie River UWA			<input checked="" type="checkbox"/>				
Chickasaw-Shiloh RCD: Const. Wetlands Proj.				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Chickasaw-Shiloh RCD: Road/Ditch Maint. Proj.				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Clinch Powell RCD: Swan Creek UWA			<input checked="" type="checkbox"/>				
Cumberland River Compact Watershed Meeting Process	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		
First TN Development District Sinking and Cash Hollow Creeks	<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>
Harpeth River Watershed Assn. Phase 3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Izaak Walton League Baker Creek			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Izaak Walton League Williams Creek			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Johnson County SCD Roan Creek UWA			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Little River Watershed Assn. Short Creek Restoration	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Middle TN State University Waterworks!	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		
Red River Watershed Assn. Visual Stream Assessment			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Sevier County King Branch STEP System			<input checked="" type="checkbox"/>				

List of Projects	Long Term Goal (LTG) 1: Stakeholder Meetings	LTG 2: TMDL Implementation	LTG 3: Watershed Restoration	LTG 4: Protection of Threatened Watersheds	LTG 5: Education	LTG 6: Process Evaluation and Improvement	LTG 7: Watershed Monitoring and Assessment
Sevier County SCD French Broad UWA			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Southeast TN RCD Oostanaula Creek UWA			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
TDA: Grant Pool Watershed Projects			<input checked="" type="checkbox"/>				
TDA-Forestry: BMP Training					<input checked="" type="checkbox"/>		
TDEC-WPC Monitoring and TMDLs		<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>
TN Environmental Council Watershed Assn. Development	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
The Nature Conservancy Big Rock Creek Restoration	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
TN RCD Envirothon					<input checked="" type="checkbox"/>		
Tennessee Technological University Constructed Wetlands for Pesticide Runoff Control			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
TN Scenic Rivers Assn. Rutherford and McCutcheon Creeks			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Tennessee Valley Authority TN Growth Readiness	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Town of Jonesborough Watershed Project	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>				
Union County SCD Bull Run Creek Restoration	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
University of TN Extension Forest*A*Syst					<input checked="" type="checkbox"/>		
University of TN Extension Internet-based Farm Mapping Tool	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
University of TN Extension Alum Amendment for Poultry Litter					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
University of TN Institute of Agriculture Center for Decentralized Wastewater Management	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

Water Quality Improvements

The following Table is Appendix A of the Proposed Final version of the 2004 303(d) List, produced by the Tennessee Department of Environment and Conservation, Division of Water Pollution Control. This document names 19 stream segments, previously identified on the 2002 303(d) List that are now fully supporting their designated uses and have been recommended, pending EPA approval, to be removed. 17 of these streams were listed as impaired either solely or partially due to some type of nonpoint source activity. Using the 319 program's GIS capabilities, maps of a select number of these watersheds were created to show the BMPs installed in these watersheds by our partners using 319 funds and state funds. These maps are not produced to prove that efforts in these watersheds by our partners are the sole reason for the improved water quality. We show these maps to indicate a level of effort of conservation practice installation in the watershed, which is likely to have contributed to the improvements in water quality. In the future it is hoped with cooperation from all partners that informative maps like this can be generated to show the total level of effort concerning conservation activities in any given watershed across Tennessee. As our partners develop and implement watershed-based plans on impaired streams, the monitoring component of the plan could likely show some level or trend toward improved water quality conditions in the stream as a result of the installation of the conservation practices. These improvements will be highlighted in future annual reports.

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***Streams on the 2002 303 (d) List That Have Been Delisted in 2004
For Reasons Related to Water Quality***

Waterbody ID	2002 Impacted Waterbody	County	Partial	Not	2002 CAUSE (Pollutant)	2002 Pollutant Source	<i>Reason For Delisting</i>
TN05130108 001 – 0400	ROCK SPRINGS BRANCH	Putnam	8.1		Siltation Other Habitat Alterations	Livestock in Stream Removal of Riparian Vegetation	This stream was reassessed in 2002 by TDEC. At mile 0.9 (Bates Road), biorecon results indicated 12 EPT families, 6 intolerant, and 29 total families. Using the Division scoring system for biorecons, this stream scored a 15 (scale = 1 – 15). The stream got a habitat score of 137, which is better than the established habitat goal for this region. Stream has improved greatly since last assessed.
TN05130108 048 – 1000	INDIAN CREEK	Putnam	31.0		Siltation Other Habitat Alterations	Dredging (gravel) Highway Mainte- nance / Runoff	This stream was reassessed in 2002 by TDEC. At mile 1.0 (Highway 96@ Hopewell Road), biorecon results indicated 8 EPT families, 2 intolerant, and 19 total families. Using the Division scoring system for biorecons, this stream scored a 9 (scale = 1 – 15). The stream got a habitat score of 125, which is better than the established habitat goal for this region. Stream has improved greatly since last assessed. Additionally, field staff now believes that the appearance of a depressed biological community in the previous assessment may have been due to a recent dry period.
TN05130202 220 – 0210	BAKERS FORK CREEK	Davidson	7.5		Pathogens	Discharges from MS4 area Industrial Permitted Runoff	This stream was posted for water contact due to elevated pathogens levels in runoff from a sludge composting facility. The facility corrected its problems and 2003 sampling indicated that water quality criteria were being met. The stream has been deposited.
TN05130202 220 – 0211	BAKERS SPRING RUN	Davidson		0.2	Nitrate Unionized Ammonia Pathogens	Discharges from MS4 area Industrial Permitted Runoff	This stream was posted for water contact due to elevated pathogens levels in runoff from a sludge composting facility. The facility corrected its problems and 2003 sampling indicated that water quality criteria were being met. The stream has been deposited.
TN05130203 023 – 0100 & 0150	WADES BRANCH	Rutherford		7.2	Siltation Other Habitat Alteration	Pasture Grazing	A siltation and habitat alteration TMDL was previously developed for this watershed and approved by EPA. This stream was reassessed in 2002 by TDEC. At mile 0.7 (Jefferson Pike), biorecon results indicated 11 EPT families, 8 intolerant, and 26 total families. Using the Division scoring system for biorecons, this stream scored a 15 (scale = 1 – 15). The stream got a habitat score of 125, which is better than the established habitat goal for this region. Stream has improved greatly since last assessed.

TN05130203 025 – 1000	CRIPPLE CREEK	Rutherford	7.7		Siltation	Pasture Grazing	A siltation and habitat alteration TMDL was previously developed for this watershed and approved by EPA. This stream was reassessed in 2002 by TDEC. At miles 0.7 (Rob Taylor Road), biorecon results indicated 8 EPT families, 3 intolerant, and 20 total families. Using the Division scoring system for biorecons, this stream scored a 15 (scale = 1 – 15). The stream got a habitat score of 146, which is better than the established habitat goal for this region. Water quality standards were also met at a chemical station located on the creek at mile 0.4. Stream has improved since last assessed.
TN05130203 026 – 3000	EAST FORK STONES RIVER	Cannon	11.1		Other Habitat Alterations	Removal of Riparian Vegetation	A siltation and habitat alteration TMDL was previously developed for this watershed and approved by EPA. This stream was reassessed in 2002 by TDEC. At mile 50.9 (Stones River Road at Witty Road), the stream was dry. It is now our opinion that the appearance of water quality impacts at this site during the previous 1997 assessment was due to periodic dryness rather than pollution effects.
TN05130204 001 – 0500	DOG CREEK	Williamson	3.8		Siltation Other Habitat Alterations	Removal of Riparian Vegetation Bank Destabilization	A siltation and habitat alteration TMDL was previously developed for this watershed and approved by EPA. This stream was reassessed in 2002 by TDEC. At mile 0.2 (Cedar Hill Road), biorecon results indicated 10 EPT families, 8 intolerant, and 24 total families. Using the Division scoring system for biorecons, this stream scored a 15 (scale = 1 – 15). The stream got a habitat score of 115, which is better than the established habitat goal for this region. The stream has improved since last assessed.
TN05130204 006 – 0500	BARREN FORK	Dickson Hickman	10.6		Siltation	Pasture Grazing	A siltation and habitat alteration TMDL was previously developed for this watershed and approved by EPA. This stream was reassessed in 2001 by TDEC. At mile 1.5 (Spencer Mill Road), biorecon results indicated 10 EPT families, 6 intolerant, and 22 total families. Using the Division scoring system for biorecons, this stream scored a 15 (scale = 1 – 15). The stream got a habitat score of 128, which is better than the established habitat goal for this region. The stream has improved since last assessed.

TN05130204 010 – 0500	BEDFORD CREEK	Williamson	5.0		Siltation Other Habitat Alterations	Livestock in Stream	A siltation and habitat alteration TMDL was previously developed for this watershed and approved by EPA. This stream was reassessed in 2001 by TDEC. At mile 0.6 (Bedford Road), biorecon results indicated 11 EPT families, 8 intolerant, and 27 total families. Using the Division scoring system for biorecons, this stream scored a 15 (scale = 1 – 15). The stream got a habitat score of 110, which is similar to the established habitat goal for this region. The stream has improved since last assessed.
TN05130204 016 – 0500	ARRINGTON CREEK	Williamson	24.6		Siltation	Agriculture Land Development	A siltation and habitat alteration TMDL was previously developed for this watershed and approved by EPA. This stream was reassessed in 2002 by TDEC. At miles 1.8 (Cox Road), biorecon results indicated 10 EPT families, 7 intolerant, and 25 total families. Using the Division scoring system for biorecons, this stream scored a 15 (scale = 1 – 15). The stream got a habitat score of 115, which is similar to the established habitat goal for this region. The stream has improved since last assessed. It should be noted that a small tributary to Arrington Creek, Paige Branch, is not included in this listing.
TN06010103 013 – 0210	SHELL CREEK	Carter	3.8		Other Habitat Alterations	Channelization	This stream was channelized in 1998, but has since recovered. This stream was reassessed in 2002 by TDEC. At miles 0.1 (U.S. Hwy 19E), biorecon results indicated 20 EPT genera, 18 intolerant, and 32 total genera. Using the Division scoring system for biorecons, this stream scored an 11 (scale = 1 – 15). The stream got a habitat score of 156, which is better than the established habitat goal for this region.
TN06010103 013 – 2000	DOE RIVER	Carter	6.4		Other Habitat Alterations	Channelization	This stream was channelized in 1998, but has since recovered. This stream was reassessed in 2001 by TVA. At a sampling station near the Doe River Gorge, biorecon results indicated 23 EPT families, 17 intolerant, and 41 total genera. Using the Division scoring system for biorecons, this stream scored a 15 (scale = 1 – 15).
TN06010201 038 – 1000	TOWN CREEK	Loudon	12.9		Other Habitat Alterations Siltation	Pasture Grazing Land Development Hydromodification	This stream was reassessed in 2002 by TDEC. At mile 0.5 (Bon Road), an RBPIII survey indicated that Tennessee's biocriteria are being met (20 EPT genera, 19 total genera. Using the Division scoring system for RBPIIIIs, this stream scored a 36, which easily passed. At mile 2.1 (Kingston Road), a second RBPIII was performed with similar results (10 EPT genera, 21 total genera, index score = 38). The sites received habitat scores of 134 and 152, respectively, which is better than the established habitat goal for this region.

TN06020002 081 - 0100	CANE CREEK	McMinn	13.7		Pathogens	Urban Runoff/Storm Sewers Pasture Grazing	The city of Etowah STP historically discharged to this stream which was previously assessed as impacted by pathogens due to sampling results from the 1990s. The stream was reassessed in 2002-2003 by TDEC, after the STP discharge was moved to another stream. At mile 1.5 (Carlock Road), only one out of 18 E. coli observations were over Tennessee's single sample maximum value of 941 cfu. The stream has clearly improved and should no longer be listed.
TN06020002 084 - 0500	LITTLE NORTH MOUSE CREEK	McMinn	8.5		Pathogens	Pasture Grazing	This stream was previously assessed as impacted by pathogens due to sampling results from the 1990s. The stream was reassessed in 2002-2003 by TDEC. At mile 0.1 (Highway 250), only one out of twenty-four E. coli observations were over Tennessee's single sample maximum value of 941 cfu. The stream has clearly improved and should no longer be listed.
TN06030003 051 – 0200	BLUE SPRING CREEK	Coffee	13.0		Other Habitat Alterations	Nonirrigated Crop Production	This stream was reassessed in 2003 by TDEC. At mile 0.8 (Old Hillsborough Road), a bioecon survey indicated 11 EPT families, 8 intolerant families, and 25 total families. Using the Division scoring system for bioecon, this stream scored a 15, which easily passed. (Scale = 1 –15). The stream received a habitat score of 136, which is better than the established habitat goal for this region.
TN06030005 084 – 1000	LITTLE SHOAL CREEK	Lawrence	20.7		Siltation	Pasture Grazing	This stream was reassessed in 2003 by TDEC. At mile 1.5 near David Crockett State Park, a bioecon survey indicated 11 EPT families, 3 intolerant families, and 28 total families. Using the Division scoring system for bioecon, this stream scored a 13, which easily passed. (Scale = 1 –15). The stream received a habitat score of 140, which is better than the established habitat goal for this region. The Little Shoal is documented habitat for a federally listed fish: the slackwater darter (<i>Etheostoma boschungii</i>).
TN06030005 106 – 0100	GRASSY CREEK	Wayne Hardin	14.9		Siltation Other Habitat Alterations	Livestock in Stream Dredging	This stream was previously assessed as being impacted by dredging activities for gravel for road construction. This activity has ceased and the stream appears to have improved. This stream was reassessed in 2002 by TDEC. At mile 0.4 (Grassy Creek Road), a bioecon survey indicated 11 EPT genera, 8 intolerant genera, and 23 total genera. Using the Division scoring system for bioecon, this stream scored a 15, which easily passed. (Scale = 1 –15). The stream received a habitat score of 159, which is much better than the established habitat goal for this region.

Blue Spring Creek TN06030003051 – 0200 Coffee County



Cane Creek TN06020002081 – 0100 McMinn County



Cripple Creek: TN05130203025 – 1000 Rutherford County



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Project Summaries for FY 2004

AUSTIN PEAY STATE UNIVERSITY: PROJECT WET FOR TENNESSEE

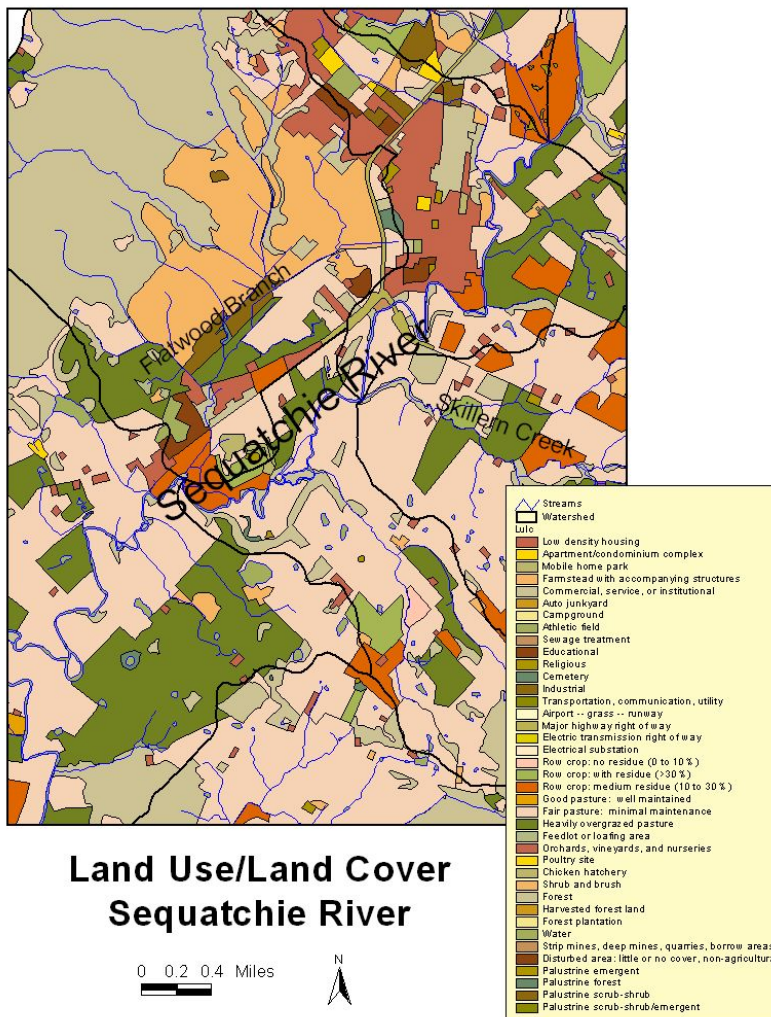
Website: <http://www.apsu.edu/wet/intro.html>

Project Water Education for Teachers, WET, is a national water education program for teachers centered at Montana State University in Bozeman, Montana. Since the inception of Project WET, hundreds of teachers in Tennessee have received the Project WET curriculum guide along with other materials to educate students about water quality. Project WET network of facilitators teaches communities about water quality in Tennessee through presentations. The facilitators are teachers, non-formal environmental education instructors, nature center educators, state water agency personnel, park service and wildlife refuge employees. To be a facilitator, one must have attended a two and a half-day workshop to learn about Project WET and Nonpoint Source Pollution in Tennessee. This project will be funded through FY2005.

STATE NPS MANAGEMENT PROGRAM MILESTONE(S) SUPPORTED

Long Term Goal 5. Improve the knowledge of stakeholders and citizens concerning the origins, magnitude, and prevention of nonpoint source pollution.

BLED SOE COUNTY SCD: SEQUATCHIE RIVER IPSI



In February and March of 2003, the Tennessee Valley Authority acquired color infrared aerial photography for the Sequatchie River Watershed.

During the period of October 1, 2003 and September 30, 2004, the 1:24,000 color infrared project aerial photography was scanned into digital format and orthorectified by January 31, 2004. Copies of the aerial photography were distributed on a CD to the Bledsoe County Soil and Water Conservation District. Beginning in February of 2004, TVA's Geographical Information and Engineering developed the NPS inventory, the inventory atlas, and the desktop GIS version, and produced five copies of the studies deliverables which will be sent to the Bledsoe County Soil

Conservation District as well as the Tennessee Department of Agriculture and the Tennessee Department of Environment and Conservation.

During this time, water quality samples were attained at 10 sites within the analysis area and data has been compiled and collected in a spreadsheet. This spreadsheet will be utilized to calibrate the pollutant load model. Currently, TVA is working on producing the pollutant load model and final report to be distributed to the Bledsoe County Soil and Waters Conservation District by February 29, 2005.

BLOUNT COUNTY SCD: LITTLE RIVER/ELLEJOY CREEK RESTORATION PROJECT (UWA)

This project will improve water quality in Little River–Ellejoy Creek by reducing the amount of nutrients, sediment loading, organic enrichment, pathogens, and suspended solids caused by agricultural and construction activities within the watershed. This will be accomplished by demonstrating new and innovative low-cost, low-tech agricultural, residential, and construction BMPs. To educate and empower landowners within the watershed with a sense of ownership for the restoration process and subsequent water quality improvements. This will be accomplished by implementing an environmental education effort targeting landowners. Very committed local district employees have effectively marketed this project to the watershed landowners. Demand for conservation practices has risen drastically from the initiation of the project. This project will be completed in FY2005.



Ellejoy farmer Davis wins state stewardship award

10-24-2004 by Thomas Fraser of The Daily Times Staff

One day John Davis looked around his Ellejoy farm and realized something was wrong. Cows were mucking up the bottoms and the streams, sediment had choked out the trout from Little Ellejoy Creek, and things just weren't as shipshape as they used to be around Triple D Farms.

"I got up one morning and (realized) it wasn't in as good shape as my granddad had it," said Davis, now a full-time cattle farmer following a career as an educator and superintendent of the Blount County School System.

"I didn't like the feeling, and I decided to do something about it.

"I got interested in trying to be part of the solution instead of the problem as far as the environment went," said Davis, a staunch Republican who proudly sports stickers on his truck proclaiming support of President Bush.

That "something" to help the four-generation, 300-acre cattle farm came in the form of "319" grant money from the Blount County Soil Conservation District by way of the Tennessee Department of Agriculture.

The money is geared toward addressing water quality impacts from agriculture in the hope of improving degraded creeks on the state's list of impaired waterways.

Davis has used about \$50,000 in grant money over the past three years -- the program requires a 25 percent match from the landowner -- to fence off about a mile of Little Ellejoy Creek, construct stream "cattle crossings" of tough synthetic material and gravel and install watering systems away from the creek.

He has also planted 800 trees on his property in the last two years to further anchor the soil, stabilize streambanks and provide wildlife habitat.

The Soil Conservation District currently has some \$550,000 in grant money available county farmers, and there is a 30-person waiting list, said county district office administrator Sandy Gregory.

Not only do such improvements benefit the environment -- including the protection of downstream points including Little River -- they also help his overall cattle operation, Davis said.

"These projects are good for the cattle."

The "frost-free" watering systems not only allow for cattle to water away from the creek, they prevent the animals from getting caught in the sucking mud that once characterized some of Davis' bottomland.

He recalls using a four-wheel-drive vehicle and lengths of rope to drag cattle out of the creek after they had become mired in mud.

The projects are also better for the animals' overall health, he said.

"A lot of science proves that drinking a clean water source" leads to better health and increased weight of beef cattle.

He has also instituted a "management intensive grazing program" that enables him to better spread his 130 cow/calf head across the land without too much impact on any particular area.

"We're preserving the land and keeping our water clean for the next three or four generations to come after," he said.

And other farmers are taking notice: The Davis farm has served as a model for best-management practices as promoted through the grant program.

"More farmers are becoming environmentally conscious," Davis said.

Stewardship award

Not only is the project a nod to his ancestors -- and his offspring -- Davis was recently given an award in Nashville "for all the conservation work he does," said Gregory. The award was bestowed personally by Gov. Phil Bredesen.

"Effective environmental stewardship is key to improving the quality of life for all Tennesseans," Bredesen said in a press release announcing the 2004 Environment and Stewardship Awards.

Davis and other recipients of the awards -- including the Little River Watershed Association -- "are modeling the way for others," said Tennessee Department of Environment and Conservation Commissioner Betsy Child.

The award winners are selected by a panel of judges representing agricultural, conservation, forestry, environmental and academic professionals once they are nominated.

Davis was nominated by the Blount County Soil Conservation District. Soil conservationist Erich Henry wrote in his nomination letter:

"The future and current conservation practices which Mr. Davis has implemented, while noteworthy, pale in comparison to his leadership abilities in promoting sound, ecologically friendly practices to his fellow agricultural neighbors," he wrote.

"Mr. Davis has gone from a reluctant participant to an avid promoter of conservation principles."

Standing on the side of Little Ellejoy Creek noting the obvious improvements, Davis again explains his motivation:

"When you get my age you start looking back. I want to leave it in as good shape or better than my grandfather left me, and that is my motive."

In FY 2004, \$37,404.57 was spent on the installation of 23 BMPs in the watershed.

CHICKASAW-SHILOH RC&D HATCHIE RIVER WATER QUALITY RESTORATION PROJECT (UWA)

This project includes BMPs such as no-till cultivation, riparian buffers, filter strips and sediment basins to control runoff. When all BMPs have been implemented, field tours will be held. Informative brochures are also being developed. The objectives of this project are to reduce the sedimentation and erosion rates on cropland by 50% in the Oxford and Muddy Creek watersheds, increase wildlife corridors and habitat through the use of field borders and riparian zones, and promote the use of BMPs through increased technical and financial assistance. In 2004, a decision was made to fund BMPs in the Big Sandy Watershed, which also is a UWA watershed and is within the jurisdiction of the RC&D council. Due to increased interest and need, a total of \$315,718 was spent installing 111 BMPs in the Hatchie and the Big Sandy watersheds.

STATE NPS MANAGEMENT PROGRAM MILESTONE(S) SUPPORTED:
Long Term Goal 3.

Restore all waters impaired by nonpoint sources that are listed on the 1998 303(d) List to the condition of fully supporting their designated uses by 2015, in cooperation with local, state and federal partners.

CHICKASAW-SHILOH RC&D: CONSTRUCTED WETLANDS PROJECT

There are numerous threatened streams in the focus areas of this project. In the areas surrounding the towns of Ramer and Guys in McNairy County it is not uncommon for the failure rates of present subsurface systems to be in the seventy (70) percent or greater range. There are many individual residences that have had long-term failures with no hope of correction by conventional means in McNairy and surrounding counties.

Even the local elementary school, Ramer Elementary, has the same problem, which has been compounded by the continued increase in the enrollment, thereby increasing the amount of effluent that must be treated by this inadequate septic system. Here, the system has been officially reported as having failed on numerous occasions.

A second emphasis of this project will be the construction of six (6) constructed wetlands on residential sites that are currently experiencing failure according to reports filed with the local TDEC-GWP office in Jackson. These sites will be in the original focus area of McNairy County and a second focus area of Fayette County further to the west and much closer to the rapid urbanization of Memphis.

To date, the wetland cells at the Ramer Elementary School have been completed, and 3 of the six residential systems have been started. This project was completed in FY2004.

CHICKASAW-SHILOH RC&D: ROAD BANK/DITCH MAINTENANCE PROJECT



Before



After

Erosion occurring on road banks and road ditches is one of the most significant contributors to stream degradation in many of the areas watersheds. Eroded soil particles ultimately ends up in the areas streams and rivers where it diminishes channel capacity causing more frequent and severe flooding, destroys aquatic and riparian habitat, and has other adverse effects on water quality and water-related activities. In some cases these critically eroding areas cause extreme safety hazards for vehicles and also degrade aesthetics of a county that can have an effect on tourism and business growth. In addition, the cost associated with maintenance of rural roads is a major portion of the counties budgets.

The eight-county project area is located on the west bank of the Tennessee River in southwest Tennessee. Within the project area it is estimated that there are 650-plus miles of roads that are in need of varying forms of maintenance along their banks and ditches. Many factors contribute to these problems including soil types; slope, run-off velocities, and size of drainage areas are physical attributes that increase the potential for erosion in these areas. Another, but significant problem is a general lack of knowledge on how to access these physical factors and viable economic solutions to address the problems. Our project shall address these two areas of concerns by educating road departments and developers on how to evaluate the physical factors and demonstrate more cost effective ways to address erosion problems.

**CLINCH POWELL RC&D SWAN
CREEK WATERSHED
RESTORATION PROJECT (UWA)**

The purpose of this project is to establish BMPs to reduce agriculture runoff through streambank improvements, livestock exclusion, and animal waste management. It will also improve stream dynamics by restoring streambank habitat and natural riparian corridors and maintain these corridors through the potential of establishing conservation easement purchases. This project will be funded through FY2005. In 2004, \$33,457.76 was spent installing 16 BMPs in the watershed.

**STATE NPS MANAGEMENT
PROGRAM MILESTONE(S)
SUPPORTED:**

Long Term Goal 3.

Restore all waters impaired by nonpoint sources that are listed on the 1998 303(d) List to the condition of fully supporting their designated uses by 2015, in cooperation with local, state and federal partners.

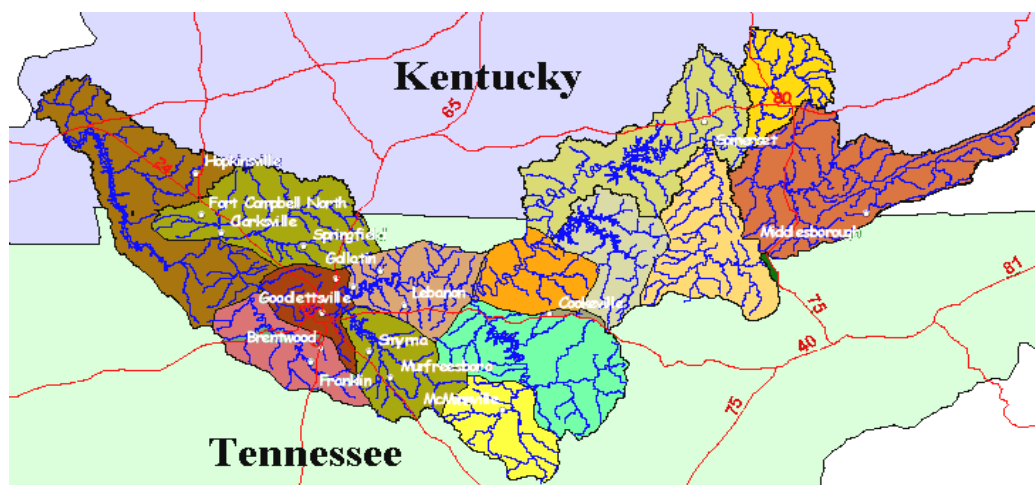
Before



After



CUMBERLAND RIVER COMPACT – CUMBERLAND RIVER WATERSHED MEETINGS PROJECT



In the year from October 2003 to September 2004 the Cumberland River Compact (The Compact) worked with the three initial watershed organizations it began and started two

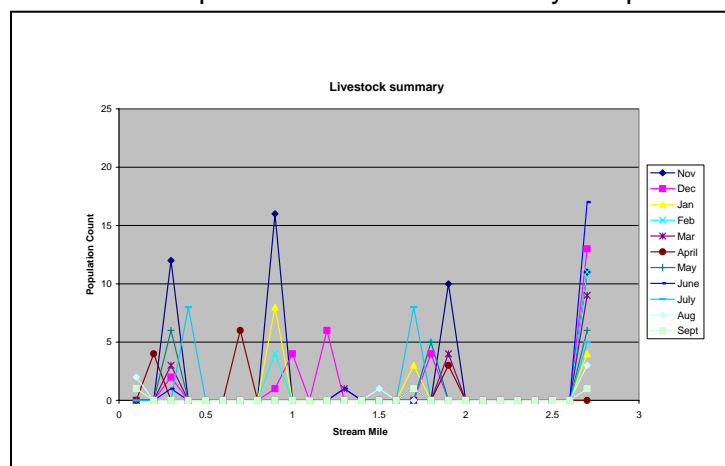
more. Organizations already started and/or strengthened with the help of 319 funds include the Harpeth River Watershed Association (HRWA), Red River Watershed Association (RRWA) and the Mid-Cumberland Watershed Coalition (MCWC). After local groups get started it is crucial they get "after care" to succeed. Examples of this which occurred during this year are: strategic planning sessions that we organize and hold with them to work on board development, by-law creation, prioritization of projects and implementation strategies; coordination of projects between watersheds and one-on-one counseling in a number of watershed topic areas. During this time period we were following up on strategic planning meetings with the MCWC. Additional follow up after care included the development of the Cumberland Basin Council. The Council was created for the purpose of enhancing communication between the new groups, strengthening on-the-ground implementation strategies to reach TMDL success levels and/or enhance quality in other 303d streams with BMPs, share the knowledge of how to accomplish that and replicate successes across organized watersheds.

In addition to caring for the groups that we already started The Compact worked hard to complete stakeholder meetings in the Caney Fork Watershed. These meetings resulted in the formation of the Caney Fork Watershed Association (CFWA), which is now working on prioritizing water quality improvement projects. We also began reconnaissance in the Stones River Watershed and began stakeholder meetings there. In spite of the fact that citizens from that watershed had already attended our meetings in the Mid-Cumberland so they could learn what to do and form a group prior to our arrival, they still wanted us to go through our entire watershed stakeholder process in their communities. Because they had not been able to achieve participation from across the entire watershed they felt they needed us and our process to get a more diverse group of citizens to participate. We have done this and are currently working with them to hold the fifth stakeholder meeting in their watershed. After the sixth meeting we hope to push them from the nest. At that point, with the help of 319 funding, we will have educated citizens across five watersheds and approximately 7,000 square miles.

FIRST TENNESSEE DEVELOPMENT DISTRICT: SINKING AND CASH HOLLOW CREEK ASSESSMENTS

The purpose of this study is to assess land use practices in the Cash Hollow watershed with the goal of targeting areas for future action to reduce the fecal coliform load in the creek.

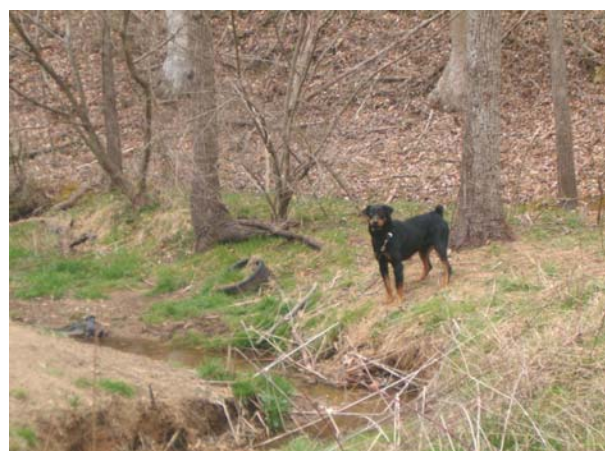
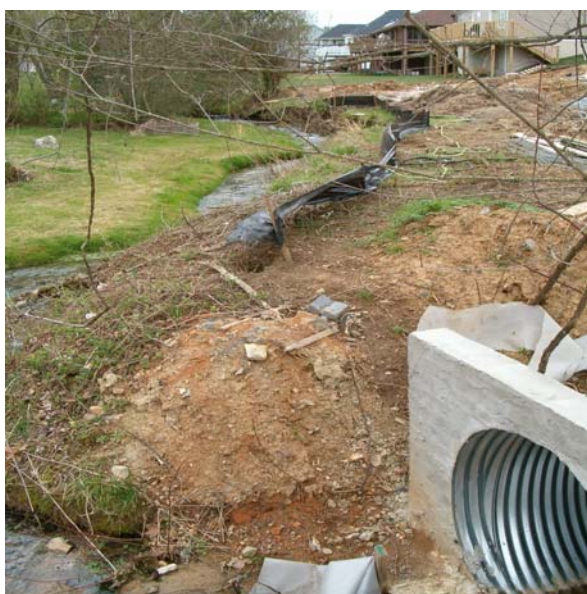
The study period began on November 1, 2003 and ended on September 30, 2004, a period of 11 months. The first quarter comprises only two months, November and December in order to match end of quarter dates with calendar year quarters.



agricultural land use acreage, livestock and domestic animal population in the watershed, wildlife population along the creek and listed areas of possible negative environmental impact. In the second quarter, livestock, domestic animal and wildlife populations were assessed. Action was taken to address possible cases of illicit discharge and negative environmental impact. Third quarter activities added the sixth and final survey, the septic survey, which entailed a door-to-door

survey of residents whose property intersected with a 50 foot corridor on either side of Cash Hollow Creek. The fourth quarter wrapped up the year with the final wildlife, domestic animal, livestock and agricultural surveys. Clean-up efforts along the creek were completed by the survey team in September.

Survey data was collected by a research team composed of ETSU students, and headed by the author. Each survey is discussed below, along with a short discussion and the raw results from the fieldwork. Each table lists the observations by stream mile, which allows for comparisons between surveys, and also facilitates future incorporation of tributary data and water quality data.



Typical photos from the Sinking Creek and Cash Hollow watershed surveys.

HARPETH RIVER WATERSHED ASSOCIATION: PHASE III WATERSHED ASSESSMENT AND RESTORATION

Website: <http://www.harpethriver.org>

During the first year of this three-year grant, the Harpeth River Watershed Association launched its nutrient study in the headwaters as part of addressing implementation strategies for TMDLs, finalized the Harpeth River Sediment Study except for distribution, continued the Stream Bank Erosion Study (begun with an earlier separate 319 grant), entered data from our Visual Stream Assessment (from a previous 319 grant) and land use data into GIS and prepared sample shape files. They developed a protocol for trained volunteers to assess construction and other sites for nonpoint source pollution (protocol is now out for review by experts in the field). They reviewed drinking water quality reports from

all utilities that supply drinking water to people who live in the Harpeth watershed. HRWA conducted education outreach efforts via our "Harpeth River E-News" and our annual "Voices for the Harpeth" newsletter which included information on the need for riparian buffers and RiverSmart tips. They also created a set of education materials (handouts) focusing on land management tips that reduce nonpoint source pollution for any landowner including rain gardens/barrels, RiverSmart tips and native plant species for stream bank corridors for general distribution. Presentations by HRWA staff were given on topics related to stormwater, site design, nonpoint source pollution, rain gardens, rain barrels and land use at the Williamson County Bloom and Grow Expo, GroWild Open House, Junior Master Gardener Camp, College Grove Senior Enrichment Center, Cumberland-Harpeth Audubon Chapter, Cool Springs Scuba Club, Kiwanis Club of Franklin and the 2004 Native Plant Conference.

HRWA expanded their River Restoration Program, working with previous landowners to plant an additional 6,000 trees on the main stem, and assisting a church group in restoring their riparian corridor on the Little Harpeth River. Roundtables have been held for Franklin, Williamson



Forty volunteers helped plant 6,000 trees along the Narrows of the Harpeth.



Cedar revetment installed on the West Harpeth on actively eroding streambank with landowner and other volunteer help.

County, and Pegram political and staff officials to build consensus and understanding on low impact development and planning options that protect water quality and reduce non-point source pollution. They have also presented at all of the Board Meetings of all Soil Conservation Districts in the Harpeth except one (Cheatham). HRWA has chosen a subwatershed in which to focus our subwatershed restoration plan and associated BMP efforts (the Kelly Creek subwatershed in the headwaters – Eagleville area). They have had

successful meetings with the mayor of Eagleville, the Rutherford County District Conservationist and other local landowners in this subwatershed. Other accomplishments include meetings by the Executive Director that have led to a residential development on the main stem of the Harpeth that is employing post-construction BMP stormwater practices to maximize stream buffers (average of 100') in order to maximize infiltration of stormwater and that will serve as a demonstration site. The Executive Director also spent nine months at the invitation of the Williamson County Mayor to serve on the Stormwater Task Force that designed the progressive county stormwater regulations that were adopted this November and of which, one of the most important components is the 100-foot stream buffer requirement. This effort built upon work done by the state-wide MS4 Working Group, a voluntary series of meetings among over 90 cities in the state that are now developing stormwater management that HRWA helped to form and attends as part of this grant, on developing a stream buffer policy that TDEC supports and was used for the Williamson County regulations. The Executive Director also continued the focus on the recently EPA developed nutrient enrichment/low DO TMDL with state, local and federal agencies and experts as it related to beginning an assessment of the in-stream flows needed for the Harpeth as it relates to the city of Franklin's proposal to increase drinking water withdrawal and the increasing sewage treatment effluent. A significant factor in the source of nutrients is non-point source upstream of the STP effluent outflow.

IZAAK WALTON LEAGUE: BAKER CREEK RESTORATION

Website: <http://www.tnike.com/html/flashpage.html>



Baker Creek is a 1673.49-acre drainage area that flows through South Knoxville and empties into the Tennessee River at mile 649 in downtown Knoxville. This watershed may be divided into two distinctive management zones, the upper half and the lower half, respectively. The Upper Half (Everything up stream of Sevierville Pike) of the watershed is sparsely developed but steep in elevation. This upper section climbs from 900 to 1200 feet, and because of this elevation gain water runs down at a high rate of speed to the lower half, creating urban runoff surge. The Lower Half (Everything down stream of Sevierville Pike) of the watershed is moderately developed and

has a recently built highway connector that runs adjacent to it. This highway introduces a significant amount of litter and increases stormwater surge that causes streambank degradation. Projects in 2004 included a stream cleanup involving the neighborhood and the coordination of a streambank restoration project at a local community center adjacent to the creek.

IZAACK WALTON LEAGUE: WILLIAMS CREEK RESTORATION

Website:

<http://www.tnike.com/html/flashpage.htm>
!

Williams Creek is on Tennessee's 303(d) List as an impaired stream. It is located in the eastern portion of the city of Knoxville, and its headwaters are in an urban area. The unique characteristics of this watershed are that its lower reach is virtually undeveloped and undisturbed. This project involves streambank restoration, riparian buffer protection, and the installation of retention and/or detention structures within the watershed to lessen the impact of storm surges on the creek. It is important to



Photos: Above, installation of root wad for streambank restoration. Left, root wads during a high flow event, holding the streambank in place.

mention that the Knoxville Utilities Board has accelerated their sewer rehabilitation schedule for the Williams Creek watershed due to the activities of this project. Some \$3-4 million dollars has been spent by KUB in the watershed. This project will be completed by FY 2007.

STATE NPS MANAGEMENT PROGRAM MILESTONE(S) SUPPORTED

Long Term Goal 3. Restore all waters impaired by nonpoint sources that are listed on the 1998 303(d) List to the condition of fully supporting their designated uses by 2015, in cooperation with local, state and federal partners.

Long Term Goal 5. Improve the knowledge of stakeholders and citizens concerning the origins, magnitude, and prevention of nonpoint source pollution.

Photos: Above, installation of root wad for streambank restoration. Left, root wads during a high flow event, holding the streambank in place.

JOHNSON CO. SCD: WATAUGA/ROAN CREEK WATERSHED RESTORATION PROJECT (UWA)

This project focuses on agricultural-related pollution sources that can be reduced by implementing the following BMPs: fencing, alternative watering systems, establishment of grass on pasture/ croplands, stream crossings, cattle access and travel lanes, heavy use areas, tree planting, streambank restoration. In addition, workshops and BMP tours will be held. This project will be funded through FY2004. The photos above are of a streambank stabilization site on Roan Creek in Johnson County Tennessee. In 2004, 6 BMPs were installed at a cost of approximately \$38,000.



STATE NPS MANAGEMENT PROGRAM MILESTONE(S) SUPPORTED:

Long Term Goal 3.

Restore all waters impaired by nonpoint sources that are listed on the 1998 303(d) List to the condition of fully supporting their designated uses by 2015, in cooperation with local, state and federal partners.

LITTLE RIVER WATERSHED ASSOCIATION: SHORT CREEK RESTORATION

Website: <http://www.blountweb.com/lrwa/>
www.littleriverbigfuture.org



The project began in February with two public meetings attended by close to fifty people. From these meetings a group of 20 volunteers emerged. These volunteers went out 12 times to collect water samples from 10 sites. In

addition, 3 volunteers collected rain date and 8 volunteers completed visual assessments. From this data we have determined that these are problems with eroding stream banks, mowing and pesticide use along the edge of the stream



and citizens that are unaware that they should have their septic tank checked once ever 3-5 years.

These volunteers logged over 495 hours and where rewarded at a BBQ along the River. The volunteers came from the Short Creek watershed, other parts of the watershed and even people from outside the watershed. As we expected by involving the community in the work we now have 31 activists for the River and Short Creek as well as donors. Our relationship with the stakeholders in this section of the watershed has grown and improved.

Because of this project we have expanded our reach in the community, obtained a Quality Assurance Plan from EPA, increased our donors, developed a volunteer base, and developed new partnerships. LRWA has also been able to identify suspect pollution sources in Short Creek.

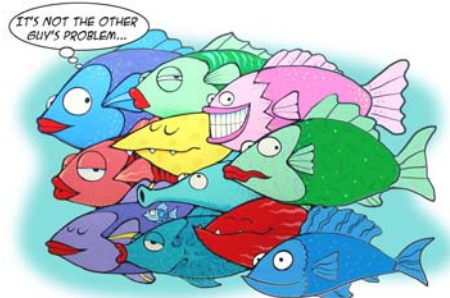
MIDDLE TENNESSEE STATE UNIVERSITY: WATERWORKS! EDUCATION PROJECT

Website: <http://www.tennesseeewaterworks.com/>



This project has developed six non-commercial sustaining announcements (NCSAs) to date, three video and three audio spots, with a second set of video and audio spots nearing completion. The emphasis is on individual responsibility for water quality improvements. The spots have been aired all across Tennessee, and plans are being made for the Phase II Stormwater communities to use the spots in their outreach

campaigns locally. Nonpoint related brochures are being produced for targeted audiences; such as agriculture, construction and homeowners that can be another tool for Phase II Stormwater communities to use. Additionally, the project has a student recognition program called Stream Savers, and they have an informational web site operational. This project is funded through FY 2005.



STATE NPS MANAGEMENT PROGRAM MILESTONE(S) SUPPORTED

Long Term Goal 5.

Improve the knowledge of stakeholders and citizens concerning the origins, magnitude, and prevention of nonpoint source pollution, and how to prevent it.

RED RIVER WATERSHED ASSOCIATION: VISUAL STREAM ASSESSMENT

Website: <http://www.redriverwatershed.org/>

Volunteers are continuing to visually assess streams that are listed as impaired by the Tennessee Department of Environment and Conservation as being contaminated by various pollutants, including sediment or siltation, nutrients, and bacteria. The RRWA will host a variety of training sessions. We are actively seeking landowners with property along streams in Robertson, Montgomery and Sumner counties who will permit access to the streams for the purpose of this study. The ultimate goal of the study is to help the RRWA to prioritize areas for future restoration and enhancement in order to help "delist" streams. This project is funded through 2008.

SEVIER COUNTY: KING BRANCH STEP SYSTEM PROJECT

This project will correct the sole source of impairment of King Branch, which is failing septic tank systems. Once the new STEP system is installed, it is anticipated that King Branch will fully support all its use designations. A portion of this project must cross the boundary of the Great Smoky Mountains National Park, so much time has been spent thus far in the project attempting to obtain all the necessary permit for this action to occur. This project will be funded through FY2005.

STATE NPS MANAGEMENT PROGRAM MILESTONE(S) SUPPORTED

Long Term Goal 2.

Fully implement all developed TMDLs for nonpoint sources in compliance with existing regulations, policies, or agreements by 2015.

(The West Prong of the Little Pigeon River is on the 303(d) for pathogens from failing septic tanks and is high on the TMDL list.)

Long Term Goal 3.

Restore all waters impaired by nonpoint source pollution that are listed on the 1998 303(d) List to the condition of fully supporting their designated uses by 2015, in cooperation with local, state and federal partners.

(The West Prong of the Little Pigeon River is on the 303(d) for pathogens from septic tanks and is rated High on the TMDL list.)

Long Term Goal 4.

Beginning in 2006, through regulatory and non-regulatory means, prevent previously unlisted waters from being included on the 303(d) List because of nonpoint source impairments.

- Action 1: Provide funding to ground water related projects to abate and prevent pollution in waters not on the 303(d) List.

(This project can be used as a demonstration for other areas within the region to show the use of STEPs to control and eliminate areas that have failing/failed septic fields with a cost-effective solution).

SEVIER COUNTY SCD: FRENCH BROAD WATERSHED RESTORATION (UWA)



Before and after photos of a critical area treatment BMP in the watershed.

This project concentrates on agriculture-related pollution sources which can be remediated by implementing fencing, alternative watering systems, establishment of grass on pasture/cropland, stream crossings, cattle access lanes, heavy use areas, critical area treatments, and streambank/riparian restoration efforts as the most effective means possible. This project will lead to a greater community awareness of water quality issues and demonstrate ways to implement BMPs, and it should improve the local water quality situation to the point of East Fork – Dunn Creek being removed from the 303(d) List. Three other impaired tributaries of the French Broad were added this fiscal year, all with the goal of removing them from the 303(d) List. Informational and educational materials will be provided. After the installation of several BMPs, a workshop and tour will be conducted. In 2004, 8 BMPs were installed at a cost of approximately \$10,100 dollars. This project will be funded through FY2005.

SOUTHEAST TENNESSEE RC& D: HIWASSEE RIVER-OOSTANAULA CREEK RESTORATION (UWA)

The primary objective of this project is to improve water quality by the reduction of sediment and pathogen loading within the watershed caused by agricultural activities. Best Management Practices (BMPs) will be installed within the upper reach of the watershed. The secondary objective of this project is to educate landowners and citizens within the watershed about watershed/water quality restoration and management processes. Demonstrations, workshops, will be held and informational literature will be produced. This project will be funded through FY 2005. In 2004, 23 BMPs were installed at a cost of nearly \$16,000 in 319(h) funds.



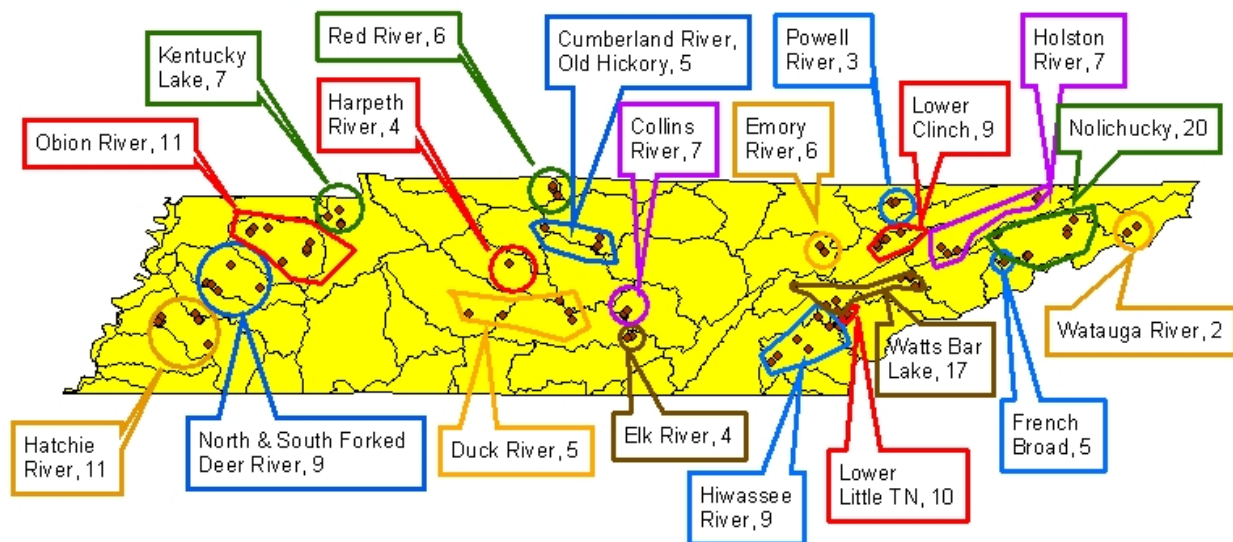
Before and after photos of a heavy use area BMP installation in the watershed.

STATE NPS MANAGEMENT PROGRAM MILESTONE(S) SUPPORTED:

Long Term Goal 3.

Restore all waters impaired by nonpoint sources that are listed on the 1998 303(d) List to the condition of fully supporting their designated uses by 2015, in cooperation with local, state and federal partners.

TENNESSEE DEPARTMENT OF AGRICULTURE: GRANT POOL WATERSHED RESTORATION



From October 1, 2003, to September 30, 2004, a total of 157 BMPs were installed on 303(d)-listed streams, at a cost of \$355,269.27. TDA continues to work through our partners to implement BMPs in impaired watersheds, with the goal of de-listing the stream reach from the 303(d) List. These BMPs are installed with the assistance of the USDA-NRCS field personnel, working with the local Soil Conservation District offices.

STATE NPS MANAGEMENT PROGRAM MILESTONE(S) SUPPORTED

Long Term Goal 3

Restore all waters impaired by nonpoint sources that are listed on the 1998 303(d) List to the condition of fully supporting their designated uses by 2015, in cooperation with local, state and federal partners.

TENNESSEE DEPARTMENT OF AGRICULTURE, DIVISION OF FORESTRY: BMP TRAINING

Website: <http://www.state.tn.us/agriculture/forestry/tdfbp.html>

TDA-Division of Forestry has developed and implemented a comprehensive Forestry Nonpoint Source Management (NPS) Program responsible for informing and educating foresters, the forest industry, and the general public about the potential for soil erosion and water pollution from forestry management activities such as road construction, timber harvesting, mechanical site preparation, prescribed burning, and pesticide use. BMPs have been adopted by TDA-Forestry as practical, non-regulatory guidelines that can be used to lessen the environmental impact of these activities. This project addresses TDA-NPS Management Program Milestone #5 (Improve the knowledge of stakeholders and citizens concerning the origins, magnitude, and prevention of nonpoint source pollution, and how to prevent it).

FY2004 Water Quality Accomplishments

A new BMP implementation survey was completed in 2004. A joint effort between the Department of Agriculture and the University of Tennessee resulted in a study of 215 randomly selected sites. BMP's were correctly implemented on 81.9 percent of the observations taken. This is a significant increase from 63 percent during the 1996 survey.

Written BMP recommendations were prepared for 794 landowners in forest management plans

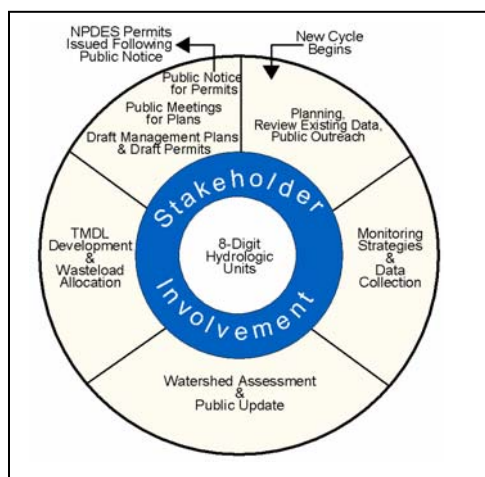


and timber sales assistance. Five BMP training sessions were held in conjunction with the Tennessee Master Logger program, attended by 91 loggers. Seventeen forestry water quality and BMP familiarization workshops were conducted for 699 resource managers, forest landowners, and loggers. TDA foresters investigated 22 complaints arising from forestry operations in cooperation with the Tennessee Department of Environment and Conservation, and investigated and made recommendations on 123 complaints from other sources.

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION, DIVISION OF WATER POLLUTION CONTROL: MONITORING, ASSESSMENT, AND TMDL DEVELOPMENT SUPPORT

Website: <http://www.state.tn.us/environment/wpc/watershed/>
<http://www.state.tn.us/environment/wpc/tmdl/program.php>

In 1996, TDEC began a watershed initiative to manage water program activities for water quality improvement. The watershed approach consists of five parts: planning and data collection, monitoring, assessment and allocation, drafting watershed plans, and implementation of watershed plans. This project assists with the assessment of watersheds through the five-year rotational watershed approach. Incremental grant funds are also allocated to TDEC-WPC to support the statewide development of TMDLs.



This project supports TDA-NPS Management Program Milestones #2 (Fully implement all developed TMDLs for nonpoint sources in compliance with existing regulations, policies, or agreements by 2015), #3 (Restore all waters impaired by nonpoint sources that are listed on the 1998 303(d) List to the condition of fully supporting their designated uses by 2015, in cooperation with local, state, and federal partners), and #7 (Use the maximum allowable percentage of funding annually to assist partners with water quality monitoring and assessment, for the duration of the 319 program). This project is funded annually by TDA-NPS.

The following is a listing of TMDL-related projects funded with this grant by TDEC's TMDL Program.

Dr. George Ridenour ridenourG@apsu.edu, Austin Peay State University
Model development, interface development of models for pollutants, data statistical analyses, data compilation, data uncertainty analysis, safety factor analysis; GIS support adaptation and revision; model verification and revision for the Red River Watershed. \$24,917.98

Dr. Dennis George dgeorge@tnitech.edu, Tennessee Technological University
Environmental assessments of pollutant source identification; verification of model inputs/outputs (ground truthing); increasing the detail for biological, chemical, or physical data for Emory River Watershed. \$5,000.00

Dr. John Schwartz jschwartz@utk.edu, University of Tennessee
Model development, interface development of models for pollutants, data statistical analyses, data compilation, data uncertainty analysis, safety factor analysis; GIS support adaptation and revision; model verification and revision for the Beaver Creek Watershed. \$25,000.00

Dr. John Schwartz jschwartz@utk.edu, University of Tennessee
Evaluation of RGA methodology to generate suspended sediment yield thresholds for impaired streams to support TDEC's development of sediment TMDLs. \$25,000.00

TENNESSEE ENVIRONMENTAL COUNCIL: WATERSHED ASSOCIATION DEVELOPMENT

The goal of the Tennessee Environmental Council's WADE project was to foster the formation of a local, bi-state South Fork watershed protection group by conducting a stakeholder process and educational outreach to the watershed community. The process was carried out in partnership with the Americorps VISTA program, the Office of Surface Mining, and the Cumberland River Compact.

As of November 2004, the project has completed the formal stakeholder meeting process. A series of 4 focus groups was followed by a series of six community stakeholder meetings held in various sites within the watershed. Although public participation proved to be difficult to achieve, the project was very successful in engaging individuals from the professional communities of both Tennessee and Kentucky. Representatives at the meetings included three local water utility managers, personnel from TN Association of Utility Districts, NRCS, the National Park Service, National Forest Service, Office of Surface Mining, a local historic society, and several conservation organizations.

The stakeholder meetings provided a series of educational programs and created a shared awareness of the key issues of water quality and quantity. Presentations included the following topics:

- a state of the watershed overview from TDEC's Jonathan Burr and KDOW's Rob Miller;
- status of local water systems from 3 local water utility managers; and
- a series of presentations on source water protection programs from TAUD's Bill Dobbins, TDEC's Tom Moss; and KDOW's Peter Goodman.

The group also created a series of watershed fact sheets and several large-scale watershed maps for use in analysis and planning.

As the meetings progressed, the group came to a collective decision that source water protection was the most important common goal within the group. Common threats to water supplies were identified and the group decided to work cooperatively toward source water protection projects in three key areas, Oneida, TN, Huntsville, TN and Whitley City, KY. The group also decided to form a new nonprofit group to be called the South Fork Watershed Association. This new nonprofit group will foster watershed protection awareness, share educational resources, and work cooperatively on restoration projects. The group has formed a steering committee and is currently working together to draft grant proposals to support source water protection projects in both Tennessee and Kentucky. The group plans to continue meeting on a monthly basis for educational programs, information sharing, and cooperative watershed protection projects. As the watershed projects move forward, the group will actively incorporate public education and outreach in their activities. It is hoped that on-the-ground projects will be successful at engaging the public to help protect their own drinking water sources.

THE NATURE CONSERVANCY: BIG ROCK CREEK PROJECT

WEBSITE

[HTTP://NATURE.ORG/WHEREWEWORK/NORTHAMERICA/STATES/TENNESSEE/PRESERVES/ART10169.HTML](http://nature.org/wherewework/northamerica/states/tennessee/preserves/art10169.html)

Now well into the third year of the project a great deal of activity is underway. Using the Management Plan created by the Center for Watershed Protection to guide our efforts, The Nature Conservancy continues to address a variety of issues in the Big Rock Creek watershed including agriculture, urban stormwater and education. Three sub-contractors are currently working on each of these issues with great success. From working with city officials on Phase 3 of the new greenway along the creek in downtown Lewisburg to planning a demonstration day at the University of Tennessee Experiment Dairy, raising awareness in the community and working with a wide array of partners have been crucial elements in the ongoing success of this project.

After a series of delays the Lewisburg City Council passed the Phase II Stormwater Ordinance in its May council meeting. The Nature Conservancy was successful in our efforts to strengthen the language in this ordinance in collaboration with the Public Works Director, R.L. Williams, and utilizing model ordinance language from other communities, particularly as regards buffer protection, establishment and maintenance. Public Works staff continues to attend training and work with other city officials to implement the Phase II requirements. Dumping and filling in the floodplain remains a common practice within the city and much of the material is being dumped by various city departments and utilities. We are currently working with Public Works and the City Manager to develop a Memorandum of Understanding for the department heads to sign and adopt regarding this practice.

The Lewisburg Greenway project is a valuable outreach tool, as well as an opportunity to re-establish a healthy buffer along the stream as it flows through downtown Lewisburg. To date, two hundred balled-in-burlap trees have been planted along the creek bank. The bioengineering firm S&ME has been hired to further improve stream condition by repairing severely eroded streambanks and creating better instream habitat. They are partnering with Jenn-Hill to design and implement a comprehensive, vegetation-heavy and low-impact solution for the impacts of years of poor stream management in the city. This project will have a tremendous impact on stream health, water quality and community awareness of good streamside management. As each section of the greenway is completed, more and more residents of Lewisburg are using the trail, developing a new appreciation for Big Rock Creek and becoming aware of the relationship between good streamside management and water quality. TNC staff has met with the City employee that directs the grounds crews and we are planning a buffer maintenance training session sometime this spring. Survival rates for the trees and shrubs planted at Marshall County High School and the City Golf Course are high. The unusually wet summer and cooperation from groundskeepers has made these two projects a success.

Even as Middle Tennessee experiences rapid growth and land use changes, agriculture continues to impact many of our streams. The Big Rock Creek Project affords us the opportunity to work with a variety of landowners - from the UT Dairy and several private dairymen to farmers who raise



beef cattle and row crops. We have hired Steve Abston, formerly with TVA, to implement the agricultural portion of the Big Rock Creek Management Plan. The need for a focused effort on farms identified as having impaired stream reaches, combined with the recent departure of the NRCS District Conservationist, compels us to sub-contract with an individual to work part-time on these areas. In a fairly short time, Steve has had great success working with landowners and has completed BMPs on three farms. These practices include livestock exclusion fencing, buffer establishment, row crop conversion, and alternate water sources.

Photos are of tree planting to establish a riparian buffer in the watershed.



We have worked closely with the UT Experiment Dairy over three years and have planted nearly 5,000 trees in an effort to create a buffer and better riparian habitat. The stream bank has healed itself to a remarkable extent, with excellent vegetation coming in now that the cows and the bush hog are excluded. Our work with the UT Dairy is ongoing and a number of engineering practices will be put in place there over the next few months. This site is highly visible and serves as a role model for dairymen throughout the area. Plans are underway to have a demonstration/field day at the site next spring.

Staff at Austin Peay has completed two in-service training sessions for elementary school teachers and hosted a canoe trip on the Duck River as a part of the in-service. Participation was small, but a good deal of interest among other teachers has been generated. A book and other curriculum materials are being produced for distribution in the spring and further in-service sessions will be offered.



**TENNESSEE RESOURCE
CONSERVATION AND
DEVELOPMENT DISTRICTS:
ENVIROTHON**

WEBSITE <http://www.appalachianrcd.org/tncd/Envirothon/>

The Envirothon is an international annual competition for high school students that develops resource stewardship and critical thinking. Participation has grown considerably in the years since the first state Envirothon. In Tennessee, regional competitions are held by the local RC&Ds. The winning teams from each regional competition go on to the state Envirothon, and the winning team has the opportunity to participate in the national Envirothon competition.

Involvement in this project supports TDA-NPS Management Program Milestone #5 (Improve the knowledge of stakeholders and citizens concerning the origins, magnitude, and prevention of nonpoint source pollution, and how to prevent it). This project is funded annually by TDA-NPS.

TENNESSEE TECHNOLOGICAL UNIVERSITY: CONSTRUCTED WETLANDS FOR PESTICIDE RUNOFF FROM NURSERY, PHASE II



This project was designed to evaluate the use of peat as an additive in constructed wetlands at a plant nursery to increase the amount of water that can be treated and decrease the amount of land needed for the constructed wetland. Once evaluated, a second goal is to demonstrate the application and use of peat in constructed wetlands plant nurseries for enhanced pesticide and nutrient removal of runoff water. This work supports TDA-NPS Management Program Milestones #3 (Restore all waters impaired by nonpoint sources that are listed

on the 1998 303(d) List to the condition of fully supporting their designated uses by 2015, in cooperation with local, state, and federal partners), and #4 (Beginning in 2006, through regulatory and non-regulatory means, prevent previously unlisted waters from being included on the 303(d) list because on nonpoint source impairments). This work is funded through FY2005.

Peat moss properties were examined to determine peat performance for removal of the pesticide simazine and phosphate. Hydraulic conductivity of peat was not limiting to the constructed gravel wetlands based on laboratory studies. A tracer study with bromide determined water flow through peat columns and were used to model simazine removal comparing batch and column studies. Initial adsorption studies of peat with simazine and phosphate under both aerobic and anaerobic controlled laboratory batch and column experiments showed simazine removal at 30% and phosphate removal at less than 10%. These adsorption removal percentages were considered low but did not account for microbial degradation of simazine. Additional media including iron wire and vermiculite were examined for possible use as a filter. Iron wire removed up to 96% phosphate but little additional pesticide at iron masses of 1 g per 100 mL. Vermiculite did not remove additional chemicals and was not studied further. Iron wire removed between 40 and 60% phosphate in 12 to 24 hours in a mesocosm experiment in the environmental growth chamber. Microbial mediated processes of peat removal of simazine were examined and compared with the previous adsorption studies. Microbial degradation removed 50% of simazine in 24 hours which was equal to the 48 hour simazine removal of the gravel constructed wetlands in the field. Peat moss/iron wire filters are currently being studied in the environmental growth chamber and at the Baxter field site.

TENNESSEE SCENIC RIVERS ASSOCIATION: RUTHERFORD AND MCCUTCHEON CREEKS RESTORATION

Website: http://www.paddletsra.org/DuckRiverProject/the_duck_river.htm

Landowner. Maury County Parks and Recreation

Site Location: McCutcheon Creek, Jerry Erwin Park, photographs 1, 2

Volunteers planted an estimated 300 trees along an unnamed tributary to McCutcheon Creek and McCutcheon Creek in Jerry Erwin Park. While the seedlings were flagged, the county's contractor mowed 50% (+/-) in August. Volunteers will be back in the winter of 2004/2005 to replant the site. In addition, volunteers and staff stabilized a 75' (+/-) section of McCutcheon Creek utilizing coir rolls and cedar revetments. A new technique was used for the cedar revetments. The trees were wrapped in jute and native willow twigs were used to "fill" the space within the branches, the trees were then anchored into the eroding bank.

Rationale for BMP implementation

McCutcheon Creek is listed as partially supporting its designated uses on the 2002 and 2004 303 (d) list. The major pollutant is silt associated with land development and urban runoff. Riparian buffers filter silt from urban runoff prior to entering the stream and the stable stream bank limits sedimentation from the stream bank, as well as creating stable habitat for aquatic insects and fish.



Left- Stream bank erosion along McCutcheon Creek prior to BMP implementation. April 2004. Estimated soil loss from 30 feet section, 270 cubic feet.
Right- Stream bank along McCutcheon Creek following BMP implementation, October, 2004

TVA: TENNESSEE GROWTH READINESS

Website: <http://tgrowth.org/>

The Tennessee Growth Readiness program reached over 300 planners and public works officials serving 270-plus communities since its start in the fall of 2003. Of these, officials serving over 180 communities evaluated development rules and identified changes that will reduce growth's impact on water resources.

Tennessee communities are determined to grow and prosper. Jobs are needed to keep communities whole. New revenue enables them to maintain and enhance community services. Yet they cherish their legacy of natural beauty and bountiful water. The Tennessee Growth Readiness program helps communities learn how land use decisions affect water quality. It gives them resources to comply with regulatory requirements, and to make informed decisions about how to grow and prosper without losing the quality of life that Tennessee's natural resources afford them.

"My county is one of the fastest growing in Tennessee. Tennessee Growth Readiness has given us a systematic way to think beyond traditional engineering approaches to managing stormwater and to working in partnership with our planning department. My colleagues in other communities have used TGR presentations with elected officials to obtain funds needed to address stormwater issues. The program is a great resource for growing Tennessee communities."

*Robert Karesh
Stormwater Quality
Coordinator, Williamson County*

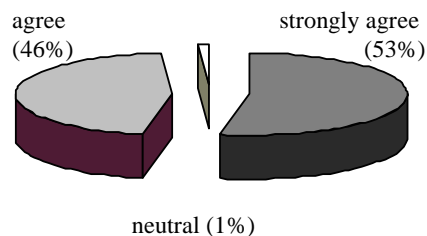
The Tennessee Growth Readiness program is for planners and public works officials because they are intimately involved in the day-to-day, nuts-and-bolts of their community's land use and water quality decisions. Officials from four communities helped develop and pilot the program for their colleagues in other communities. They worked with the Tennessee Department of Agriculture, UT's Water Resources Research Center, Southeast Watershed Forum and Tennessee Valley Authority, to build the program from existing best practices by the University of Connecticut, State of Alabama and Center for Watershed Protection.

Tennessee Growth Readiness workshops and technical assistance considered as a whole supports communities' logical progress toward reducing the impact on water resources as they develop. Here is an outline of program resources:



Memphis-area planners and public works officials work together in a TGR workshop. They are developing a proposal for the County Mayor to reduce growth's impact on water resources.

"Our water quality awareness and expected improvements in regulations would have been inconceivable without your well formulated procedures and resources." - Michael Oakes, County Engineer, Shelby County



Here's what participants said when asked if TGR workshops and technical assistance was effective and useful.

Leadership Training

Participants learn to make presentations and gain support for different approaches to how their community manages growth.

"My staff serves 212 cities and counties in Tennessee. Since our training, we've presented to planning commissions in 45 communities. Also, we're evaluating zoning, subdivision and site design regulations in 155 of our contract communities. The results are helping us make our work plans for these communities. The planners find TGR training extremely valuable. We continue to find opportunities to use what we've learned to help our communities."

Dan Hawk
Director, State Local Planning Assistance,
Tennessee Department of Economic and Community Development

Site Planning Roundtable Management Training

Participants learn to evaluate their development rules against model principles, and to lead a consensus building process for adopting new principles and planning practices.

Land Use Planning for Water Quality

Participants learn to make land use allocation decisions that reduce the impact of future growth on water resources. These decisions complement new development rules.

Action Planning

Participants develop a work plan for changing their development rules and processes. The work plan outlines specific actions and responsibilities for participants.

"We used TGR presentation materials extensively to support the Blount County Water Quality Plan. Through the program, the cities of Maryville and Alcoa joined with us to undertake a joint review of regulations, comparing zoning and subdivision regulations with ideal standards relating to water quality."

John Lamb
Director of Planning, Blount County

Multiple Jurisdiction Review Workshop

Participants identify how they can work together across jurisdictional boundaries on changes to development rules and processes.

Community Growth Readiness Workshop Series

Through a series of workshops, community opinion leaders come to consensus on changes to their community's development rules and processes.

HOME MATTERS
Government, developers working together
Roundtable strives for environmentally friendly development

By Ronde Robinson
KNOXVILLE TIMES-SENTINEL

Imagine a neighborhood where apartments overlook a bank and a gas station, attached housing sits next to expensive single-family residences, the streets run different widths, and the residents vary widely in income.

Welcome to Sequoyah Hills, one of Knoxville's



From left: Cindy Plonko, Leo LaCamera and Chris Graglia, all with the Knox Site Planning Roundtable, review subdivision plans at the Knox County Department of Engineering and Public Works.

The Knoxville News-Sentinel covered the Site Planning Roundtable as they recommended

TOWN OF JONESBOROUGH: WATERSHED RESTORATION PROJECT

The Town of Jonesborough has initiated work on Phase 1 of a two-phase project involving the construction of new detention ponds and the re-engineering and improvements on two existing detention ponds that are being designed to reduce the pollutants going into Little Limestone Creek. The project uses detention ponds built to have a multi-property impact while using plant material and riparian buffers to remove silt and pollutants in the drainage ways. Jonesborough's goal is to remove the portion of Little Limestone Creek flowing through the Town from the States 303(d) list of polluted streams.

Phase One of the project involves the purchase of land to construct a large detention pond as well as re-working the two existing ponds upstream. The Town has purchased the land.

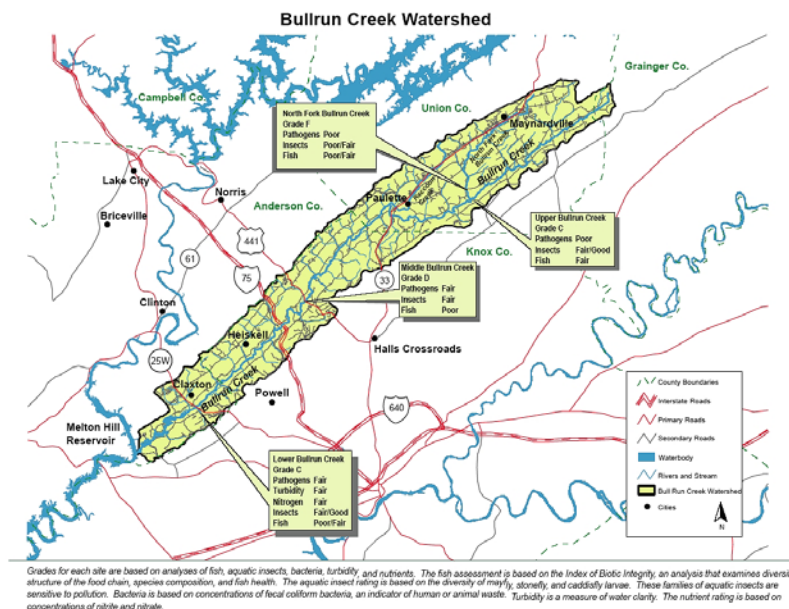
The engineering and landscaping design involving the reconstruction of the two existing detention ponds, the construction of a new larger detention area with forebays and trees, shrub and perennially plantings has been completed and approved. The Town has held public workshops with residents of the project area to discuss the work proposed and the benefits of the project. Residents along the drainage way have been sent an agreement to review and sign authorizing the Town to undertake the work.

The construction work has been bid and the contract awarded to Lightner Excavating, Inc. who will begin work immediately after the Thanksgiving holiday. Work is expected to be completed by the spring of 2005. Planting plans have been developed and the pond areas will be planted in spring as well.

Negotiations have been initiated to obtain the property necessary to construct a new large detention pond in the drainage area flowing from the Walnut Grove and Royal Oaks subdivision areas as well as the commercial sites at the east end of Jonesborough. Stormwater and pollutants generated from this area flow into the floodway of the "Unnamed Tributary" flowing behind the Town Hall and Visitor Center complexes and directly into Little Limestone Creek. Although, only one pond is involved in the Phase Two aspect of the 319 Project, the Town has been working with multiple property owners on detention areas upstream that will also help in reducing pollutants that eventually can end up in Little Limestone Creek. Work on Phase Two will hopefully be completed by the fall of 2005.

East Tennessee State's Department of Health and Environment has obtained their QAPP from EPA and have been water quality testing 20 locations of Little Limestone Creek. The Town has contracted with the University to carry out baseline monitoring of the stream to get a realistic picture of its current condition, and testing will continue to determine the impact of the 319 Project once the pond work has been completed.

UNION COUNTY SCD: BULL RUN CREEK RESTORATION PARTNERSHIP



The Bullrun Creek watershed drains a 104 square mile area that includes parts of Anderson, Grainger, Knox, and Union Counties. Hallsdale-Powell Utility District and Maynardville Utility District draw water from the watershed. Bullrun Creek is classified as impaired by the State of Tennessee [303(d) list]. Causes for this impairment are siltation, pathogens, and habitat alterations from agriculture, permitted

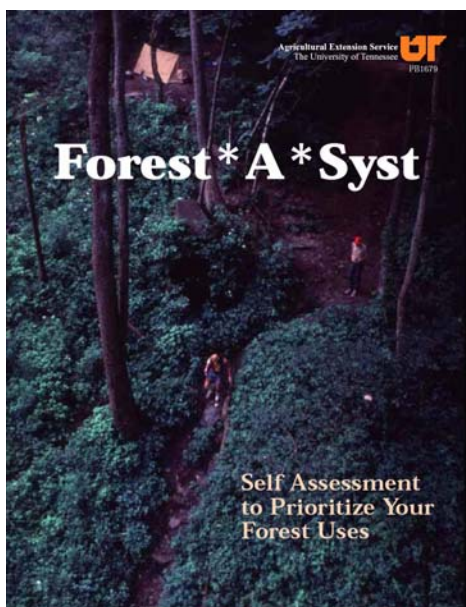
industrial discharge (quarry), and a minor municipal point source.

The Bullrun Creek Restoration Partnership (BCRP) was formed in 1999 in response to concerns expressed by watershed residents about deteriorating water quality, along with several requests for assistance implementing agricultural best management practices (BMPs). This partnership was formed to coordinate efforts of 14 agencies to restore water quality in the Bullrun Creek watershed. BCRP members bring a broad base of knowledge, expertise, and resources to this initiative. BCRP's long-term goal is to restore Bullrun Creek and remove it from the 303(d) list. Changing land management practices which impact water quality will take several years and will require a comprehensive program with the following elements:

- **Resource condition and pollution source assessments** – Partners have collaborated with TDEC to assess the physical, chemical, and biological condition of Bullrun Creek's water resources. This information will provide a baseline to evaluate the success of this restoration initiative. A geographic watershed database and pollution load model has been developed to target pollution reduction efforts and track implementation of BMPs.
- **Community support** – A public meeting was held in the summer of 2001 to gauge community support for a watershed restoration initiative. A video and fact sheet explaining watershed conditions, impacts, and possible solutions were developed for this meeting. The meeting drew over 200 people who voiced strong support for proceeding with this initiative.
- **Information/education** – Partners have promoted conservation BMPs, educated area residents, showcased new equipment, presented new information, and increased awareness of incentives available to landowners. Communication tools have included two videos, a watershed fact sheet, annual model farm tours, a 2003 Bullrun Creek Watershed BMP calendar, frequent articles in local newspapers, an awards banquet, and biannual newsletters.

- **Technical assistance** – Partners provide a wide variety of assistance, including one-on-one discussions, demonstrations, farm plans, drawings and plans, implementation instructions, and oversight.
- **Funding** – Cost share and other financial incentives have been made available to watershed residents from Nonpoint Source Program, Tennessee Department of Agriculture, EQIP, CRP, and Tennessee Valley Authority to assist with and encourage BMP implementation.
- **BMP implementation** – Partners have assisted property owners in improving over 500 acres of pasture, establishing or enhancing 18,000 feet of riparian buffers, and stabilizing 8,000 feet of eroding stream bank.

Clear pollution reduction goals, a diverse partnership, and strong community support are key elements to making this initiative successful. BCRP is committed to this watershed restoration initiative until the restoration of Bullrun Creek is complete.



UNIVERSITY OF TENNESSEE, FORESTRY EXTENSION: FOREST*A*SYST

Website:

<http://utextension.tennessee.edu/publications/pbfiles/PB1679.pdf>

During the time period of 10/1/03 to 9/30/04, funds provided by TDA Nonpoint Source Pollution Program were used to introduce the Forest*A*Syst Phase II program to private forest landowners in Tennessee. Three additional County Forestry Associations were formed, involving 8 counties, collectively reaching 161 landowners whom collectively own 24,150 acres of forestland. Subsequently, each of these Associations received a follow-up evening program where the Forest*A*Syst power point was presented to educate

the owners about forestry BMPs. Two forestry field days were held where BMPS were addressed.

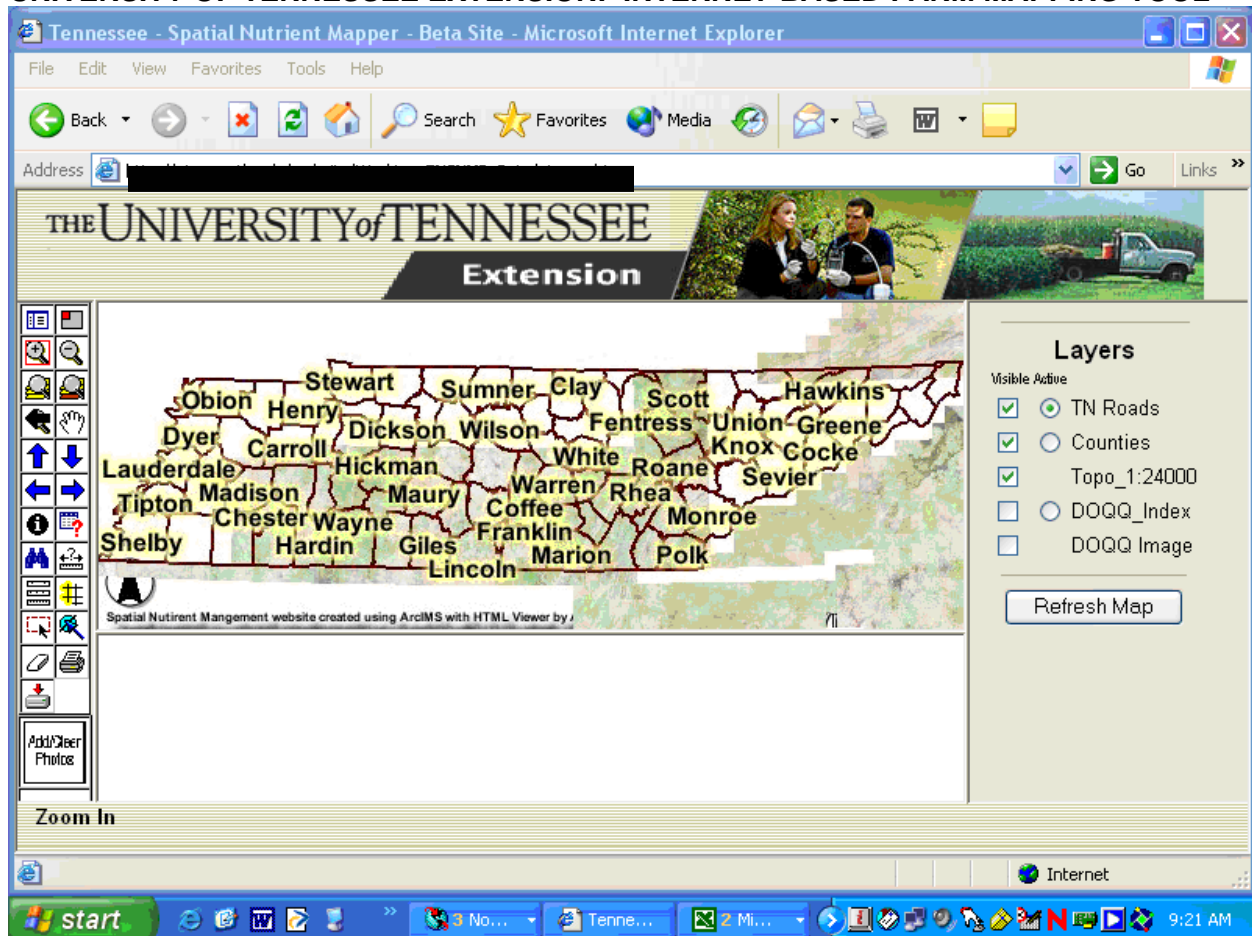
From surveys of the participants, the results of the program indicate: 98.6 % of the participants are willing to adopt the material presented, and estimated the value of the program with regard to dollars earned or saved for their property at \$27,663. Using a 5-part Likert scale (1 being low and 5 being high), respondents indicated an improvement in understanding and knowledge of nonpoint water pollution as follows:

Item	Before Program	After program
Your understanding of nonpoint water pollution	2.0	4.26
Your knowledge of methods to reduce Nonpoint water pollution in forestry	1.98	4.15

Operations

In addition, 97% of the participants indicated a better familiarity of the need to receive technical assistance with their forestry and wildlife management in order to minimize nonpoint source water pollution.

UNIVERSITY OF TENNESSEE EXTENSION: INTERNET-BASED FARM MAPPING TOOL



Work on the project began in May 2004 with the hiring of Mr. Alan Jolly a recent graduate of the University of Tennessee's Geography Department.

The objective of this project is to develop web-based tools that will enable Tennessee producers to create accurate farm maps for use in the development of nutrient management plans. Rather than duplicate the approach being taken by the University of Missouri's Center for Agricultural and Environmental Science (CARES) that requires users to have GIS software installed on their computers, this project aims to develop web-based tools. New software has now become available that greatly extends the functionality of web based GIS systems to dynamically create and edit shapefiles, a necessary component for advanced geoprocessing. A beta-version of a website is currently under development and will be shared with stakeholder groups early in 2005.

During the year meetings and consultations have been held with agency personnel and partners from USDA's Natural Resources Conservation Service (NRCS) and Farm Services Agency (FSA), Tennessee GIS Interest Group, the Southern Appalachian Information Node (SAIN) and University of Tennessee Map Library and well as the University of Missouri's Center for Agricultural and Environmental Science (CARES). Partners were informed of the project and will be asked to test and critique the products when they are nearer completion.

UNIVERSITY OF TENNESSEE, INSTITUTE OF AGRICULTURE: ALUM AMENDMENT FOR POULTRY LITTER PROJECT

Website: <http://www.utextension.utk.edu/publications/infosheets/Pss318/PSS318.htm>



During the year (October 2003 to September 2004) alum demonstrations were conducted on three poultry farms in counties in middle Tennessee (Bedford, Moore and Grundy). The use of liquid alum for in-house ammonia control, the reduction of soluble phosphorus and the economics of using alum were demonstrated. Treatments on each farm started in October 2003, and continued on through the winter months. All products were purchased from Royster-Clark (Manchester) and applied by personnel from that company. On each farm four different houses were treated with two

different rates of liquid alum. In two of the houses the whole house was treated, in the other two houses only the brooder area was treated. On the Bedford county farm an additional comparison was made with dry alum. Dry alum is being used in one house at a rate of approximately 100 lbs. per 1,000 square feet over half of the house.

It was not possible to collect all the data necessary to make a complete economic evaluation of the use of alum on all the farms involved in the demonstrations. Logistically it was not always possible to collect the data necessary to determine differences in bird performance (feed conversion rates, average weight etc.) General trends that were observed were that:

1. Alum use reduced the average number of mortalities in most houses.
2. Alum use reduced the amount of propane used to heat the houses.
3. Reductions in mortalities and savings in propane use were usually not enough to offset the costs of using higher rates of alum.

A major finding from these demonstrations was that it was most economic to use alum at the lower rates (recommended to control ammonia) in only the brooder portion of houses. There is no economic incentive to use higher rates or to treat the whole house. Without incentives it will be difficult to get producers to use the higher rates of alum, recommended for optimizing the reduction soluble phosphorus in the litter. In addition to on farm application demonstrations a land application of alum treated and untreated litter was established in the spring 2004 at the Greeneville experiment station in Greene County. This demonstration was a tour stop included in the Southeastern Agricultural and Urban Expo planned in July 2004. In 2003, on-farm demonstrations were successfully completed in Fentress, Obion, Greene, and Coffee counties.

Demonstrations were begun and are now continuing in Bedford, Grundy, and Moore counties. Intensive in-house environmental monitoring was done in Fentress County in conjunction with liquid alum application.



**UNIVERSITY OF TENNESSEE,
INSTITUTE OF AGRICULTURE:
CENTER FOR DECENTRALIZED
WASTEWATER MANAGEMENT**

Website:

<http://onsite.tennessee.edu/>

With funding provided by the Tennessee Department of Agriculture Nonpoint Source Program, the University of Tennessee was able to develop the Center for Decentralized Wastewater Management (CDWM). This center was founded in August of 2002. Currently the center is

staffed by a Director, Dr. John Buchanan, a Research Associate, and graduate and undergraduate students. The fundamental objective of the CDWM is to provide outreach education to onsite wastewater practitioners, academic education to engineering and science students, and research for the advancement of the science.

During FY2004, the CDWM cosponsored three wastewater subsurface drip distribution design workshops. In cooperation with the Tennessee Valley Authority (TVA), these workshops were well-attended by engineers, regulators, and installers from Tennessee, Alabama, and North Carolina. Wastewater dispersal using drip irrigation is an emerging technology and there is a strong demand for additional workshops.

A new graduate-level course was developed to teach the science and practice of onsite wastewater renovation to engineering and science students. The first offering of this course was Fall 2004. The graduate student that is funded by this grant has made significant progress toward understanding the fate and transport of triclosan, the anti-microbial found in many hand soaps. Little is known about the persistence of triclosan in an onsite wastewater system and in the soil environment. The CDWM received a \$90,000 grant from the TVA to conduct research on using drip irrigation to disperse wastewater into the soil. This funding will be used to construct a field-scale study that will investigate how the soil will respond to varying strengths of wastewater using drip irrigation as a subsurface dispersal method.

For additional information, please contact John Buchanan at 865-974-7266 or at jbuchan7@utk.edu

STATE NPS MANAGEMENT PROGRAM MILESTONE(S) SUPPORTED

Long Term Goal 4.

Beginning in 2006, through regulatory and non-regulatory means, prevent previously unlisted waters from being included on the 303(d) List because of nonpoint source impairments.

- Action 1: Provide funding to ground water related projects to abate and prevent pollution in waters not on the 303(d) List.
- Action 2: Provide funding to ground water related demonstration projects annually.

Long Term Goal 5.

Improve the knowledge of stakeholders and citizens concerning the origins, magnitude, and prevention of nonpoint source pollution, and how to prevent it.

- Action 1: Develop and distribute educational material concerning Ground Water issues in increasing amounts each year.
- Action 2: Provide funding to ground water related demonstration projects annually.
- Action 4: Develop at least three demonstration projects focusing on the importance of ground water quality protection.

Tennessee's 319 Program and the Activities of the EPA Strategic Plan

According to email correspondence received from Region 4, Tennessee's Nonpoint Source Program is to consider adding any accomplishments of the following four activities to our annual reports. Officially, reporting on these activities will likely be required beginning with the FY 2005 Annual Report, but it is suggested that, if activities have been accomplished, states should claim credit now. Each activity is listed below with an accompanying response from TDA-NPS.

Activity 48. The number of watershed based plans (and water miles/acres covered), supported under State Nonpoint Source Program grants (section 319) since the beginning of FY 2002 have been developed and the number of watershed based plans, (and water miles/acres covered), where watershed based plans are being implemented.

TDA-NPS Response: The number of watershed based plans supported by 319 grants since FY 2002 will be reported in the FY 2005 Annual Report.

Activity 49. Number of watershed based plans (and water miles/acres covered), supported under State Nonpoint Source Programs (section 319) since the beginning of FY 2002 that have been substantially implemented.

TDA-NPS Response: To date, no watershed based plan has been substantially implemented. It is believed that at least one watershed will be in this category at the conclusion of FY2005.

Activity 56. Number of waterbodies identified by States in 2000 as being impaired by nonpoint sources or by both point & nonpoint sources that are fully restored (cumulative). [Estimated 5,967 waterbodies impaired solely or partially by nonpoint source]

TDA-NPS Response: Since the 303(d) List is developed by the Tennessee Department of Environment and Conservation- Division of Water Pollution Control, EPA should request this information from appropriate staff with this agency.

Activity 57. Annual reduction in lbs/tons of nitrogen, phosphorus, and sediment from nonpoint sources to waterbodies

TDA-NPS Response: It is understood that EPA will retrieve this information from the GRTS system. A decision will be made prior to submittal of the FY 2005 Annual Report about whether to include this information.